ABSTRACT

The present invention provides a bioreactor comprising a vessel having a bottom region and an interior configured to contain an aqueous suspension of biomass and media. A first gas outlet is provided at the bottom region of the vessel. The first gas outlet is positioned to introduce a first stream of gas to promote growth of the biomass on the media. A lift tube is disposed within the vessel, the lift tube having an inlet disposed at the bottom region of the vessel. A second gas outlet is disposed proximal the lift tube inlet to feed gas to the inlet of the lift tube.